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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/796,116 | 03/10/2004 | Tamotsu Morimoto | 249494US26 | 2485 |
| 22850 | 7590 | 08/10/2007 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. | | | CROWELL, ANNA M | |
| 1940 DUKE STREET | | | ART UNIT | PAPER NUMBER |
| ALEXANDRIA, VA 22314 | | | 1763 | |
| NOTIFICATION DATE | | DELIVERY MODE | | |
| 08/10/2007 | | ELECTRONIC | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/796,116 | MORIMOTO ET AL. | |
| | Examiner | Art Unit | |
| | Michelle Crowell | 1763 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 26 July 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 7-12 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 24, 2007 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 7-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 7 recites the limitation, "the drive mechanism sets the spacing from a first spacing to a second spacing before the time of plasma extinction and after the time of plasma ignition, and the second spacing is larger than the first spacing". This limitation actually reads on the second spacing (larger than the first spacing) occurring during plasma processing which the

specification fails to support. As seen in Figure 2B, during the plasma processing, the second spacing is smaller than first spacing shown in Figure 2A (plasma ignition).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 7 is rejected under 35 U.S.C. 102(a) as being anticipated by Haji (J.P. 10-302998).

Referring to Drawings 1-8 and paragraphs [0014]-[0032], Haji discloses a plasma processing apparatus comprising: a lower electrode 7 for placing an object 13 to be processed thereon (par.[0016]); an upper electrode 25 disposed above the lower electrode 7 so as to oppose it (par.[0018]); an adjusting mechanism 24 for adjusting a spacing between the upper and lower electrodes 21, 4 by raising or lowering the lower electrode, the adjusting mechanism including a driving mechanism 28 (par.[0018]); and a high-frequency power supply 14 for applying high-frequency power to at least one of the upper and lower electrodes 7, the high-frequency power being applied to either one of the electrodes to cause plasma igniting (par.[0023]), wherein the drive mechanism 24, 28, sets 38 the spacing from a first spacing (Drawing 3) to a second spacing (Drawing 5) before the time of plasma extinction and after the time of plasma ignition, and the second spacing is larger than the first spacing (par.[0021]-[0023]).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 7-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koshiishi et al. (U.S. 5,919,332) in view of Haji (J.P.10-302998) or Yada et al. (J.P. 2002-359203).

Referring to Figure 1 and column 9, line 7-column 11, line 36, Koshiishi et al. discloses a plasma processing apparatus comprising: a lower electrode 6 for placing an object W to be processed thereon (col. 9, lines 16-19); an upper electrode 21 disposed above the lower electrode 6 so as to oppose it (col. 9, lines 66-67); an adjusting mechanism 7 for adjusting a spacing between the upper and lower electrodes 21, 6 by raising or lowering the lower electrode, the adjusting mechanism including a driving mechanism 8 (col. 9, lines 20-27); and a high-

frequency power supply 47, 44 for applying high-frequency power to at least one of the upper and lower electrodes 21, 6 the high-frequency power being applied to either one of the electrodes to cause plasma igniting (col. 11, lines 23-29).

Koshiishi et al. fail to teach the drive mechanism sets the spacing from a first spacing to a second spacing before the time of plasma extinction and after the time of plasma ignition, and the second spacing is larger than the first spacing.

Referring to paragraphs [0021]-[0023] of Haji or paragraph [0046] of Yada et al., Haji or Yada et al. teach a drive mechanism 24, 28, 38 of Haji or 8,9 of Yada et al. sets the spacing from a first spacing to a second spacing before the time of plasma extinction and after the time of plasma ignition, and the second spacing is larger than the first spacing. For example, in Haji the spacing increases during plasma processing Yada et al. the spacing changes from 0.8 cm to 1.5 cm (or 0.8 cm to 4.0 cm) during plasma processing. By adjusting the electrode spacing, optimal plasma processing conditions can be achieved. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to set the drive mechanism of Koshiishi et al. with the spacing from a first spacing to a second spacing before the time of plasma extinction and after the time of plasma ignition, and the second spacing is larger than the first spacing as taught by Haji or Yada et al. in order to achieve optimal plasma processing conditions.

With respect to claim 8, the plasma processing apparatus of Koshiishi et al. further comprising: a first high-frequency power supply 247 for applying first high-frequency power to the upper electrode 21 (col. 9, lines 23-29); and a second high-frequency power supply 44 for

applying second high-frequency power having a lower frequency than the first high-frequency power to the lower electrode (col. 9, lines 17-23).

With respect to claim 9, the plasma processing apparatus of Koshiishi et al. further includes that the adjusting mechanism 7, 8 has a drive mechanism for moving the lower electrode away from the upper electrode (col. 9, lines 20-27).

With respect to claim 11, the plasma processing apparatus of Koshiishi et al. further includes that etching is performed as the plasma processing (col. 9, lines 7-9).

With respect to claim 12, the plasma processing apparatus of Koshiishi et al. in view of Yada et al. further includes wherein the driving mechanism sets the spacing to the first spacing (0.8 cm) after the time of plasma ignition (paragraph [0046] of Yada et al.).

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koshiishi et al. (U.S. 5,919,332) in view of Haji (J.P.10-302998) or Yada et al. (J.P. 2002-359203) as applied to claims 7-9 and 11-12 above, and further in view of Tsuchiya et al. (U.S. 5,716, 534).

The teachings of Koshiishi et al. in view of Haji or Yada et al. have been discussed above.

Koshiishi et al. in view of Haji or Yada et al. fail to specifically teach that the first high-frequency power is turned off after the second high-frequency power is turned off.

Referring to column 12, line 66-column 13, line 8, Tsuchiya et al. teaches a plasma processing apparatus wherein the first high-frequency power is turned off after the second high-frequency power is turned off so that the charges accumulated on the object can be removed. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention

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for the first high-frequency power of Koshiishi et al. in view of Haji or Yada et al. to be turned off after the second high-frequency power is turned off as taught by Tsuchiya et al. so that the charges accumulated on the object can be removed.

Response to Arguments

10. Applicant's arguments with respect to claims 7-12 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (571) 272-1432. The examiner can normally be reached on M-F (9:30 -6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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